

REMARKS

By this amendment, claim 5 has been amended, claim 6 has been cancelled, and claims 12 and 13 have been added. Thus, claims 5, and 7-13 are now active in the application. Reexamination and reconsideration of the application are respectfully requested.

In item 10 on pages 4 and 5 of the Office Action, the Examiner kindly suggested claim language that would be sufficient to define over the combination Oshima and Fujikawa. This suggested language has been adopted in the above-mentioned amendments to claim 5 and, accordingly, it is respectfully submitted that the rejection of claims 5, 6 and 9-11 as being unpatentable over Oshima in view of Fujikawa, has been obviated. Therefore, it is respectfully submitted that the present independent claim 5, as well as the dependent claims 7-13 which depend therefrom, are clearly allowable.

Also in items 9 and 10 on pages 4 and 5 of the Office Action, however, the Examiner drew Applicant's attention to US PGPUB 2004/0211384 to Glinsner (hereinafter, Glinsner), and indicated that "*Glinsner teaches in paragraph 32 that various angular positions of elements of a counterweight are possible, and that their optimization for the reduction of vibration in a reciprocating piston machine is a matter of ordinary experimentation. As such, even if the combination of Oshima and Fujikawa is overcome, the examiner believes that the invention as disclosed in the instant application is obvious in view of Glinsner.*"

Initially in this regard, claim 5 has been further amended to more clearly distinguish over the teachings of the Glinsner publication. Specifically, claim 5 has been amended to include the limitations of now-cancelled claim 6, and also, it is now specified in claim 5 that the balancing weight is for "balancing vibrations produced by operation of a combination of said piston, said connecting rod and said eccentric section," as shown in the drawing figures and described in the present specification at, for example, page 7, lines 11-15 of the substitute specification filed December 23, 2008 (hereinafter, the substitute specification). This clarification of the present invention clearly distinguishes over the Glinsner configuration, because the Glinsner balance weight (offset crank web 200) that is somewhat similar to the balance weight of the present invention, is configured and arranged so as to balance vibrations produced by operation of a combination of, not only the pistons 50, connecting rods 80 and eccentric section (see eccentric section axis 100 in Fig. 2), but also the counterweight 120 which includes the lever arm 140 connected to the crankshaft 20 at the counterweight connection rod axis 170 via the

counterweight connection rod 130, and also to the crankcase 30 at the lever arm axis 150. In other words, balancing weight (offset crank web) 200 of Glinsner does not balance vibrations produced by operation of a combination of a piston, a connecting rod and an eccentric section, but rather balances vibrations produced by operation of a combination of the pistons, the connecting rods, the eccentric sections and the counterweight 120.

Also, regarding the illustrated relative positions of the center of gravity 210, the crankshaft axis 40 and the eccentric section axis (piston connecting rod axis) 100 of Glinsner (described, for example, at paragraph [0029] of Glinsner) cannot be readily adapted to the Oshima configuration, the Fujikawa configuration or any combination thereof, because the relative positions of the center of gravity 210, crankshaft axis 40 and eccentric section axis 100 in Glinsner are necessarily arranged and configured taking into account the presence of the counterweight 120, which is not present in Oshima, Fujikawa or any reasonable combination thereof. That is, in Glinsner, not only the offset crank web 200, but also the counterweight 120 are provided as a combination unit that together provide the necessary counterbalance, such that the particular angle θ (see Fig. 1) is determined based upon the presence of both the offset crank web 200 and the counterweight 120 (see, for example, paragraphs [0029] – [0030]). Further in this regard, it is noted that the center of gravity 210 in the Glinsner publication does not correspond to the center of gravity of the balancing weight 108 according to the present claim 5. Rather, as described in the Glinsner specification (see paragraph [0029], lines 3-7), the center of gravity 210 is a center of gravity “of the crankshaft 20 (including the offset crank webs 200)”. Therefore, any suggestion in Glinsner of the particular location of the center of gravity 210 relative to crankshaft axis 40 and eccentric section axis 100 does not correspond to the claimed feature of the present invention as set forth in the last paragraph of claim 5.

Further, the very general mention in the Glinsner publication (in lines 9-14 of paragraph [0032] of Glinsner) cannot properly be said to provide a sufficient teaching to result in or otherwise render obvious the present invention of claim 5, and in particular, the specifically claimed relationship in the last paragraph of claim 5, taking into account the disclosures of Oshima, Fujikawa and Glinsner. It would have been apparent to a person of ordinary skill in the art that the description in paragraph [0032] of Glinsner cannot render obvious all relationships for balancing weights of crankshafts, but can only be said to be a recognition that a person of ordinary skill in the art would understand that adjusting and optimization of any

counterbalancing assembly is necessary and desirable within the confines of the particular configuration described in the prior art. In other words, Glinsner discloses the configuration of the offset crank web 200 when used in the combination including the counterweight 120, and sets forth the various lengths L, C, W, R, Z_c, Y_c, Z_s, Y_s, and the angle θ and α, as well as masses, shapes and centers of gravity, but does not provide exact dimensions for every configuration, such obviously being left to the skill of an ordinary artisan, as referenced in paragraph [0032] of the Glinsner publication. Clearly, the discussion in paragraph [0032] of Glinsner must be taken in the context of the Glinsner disclosure, and cannot be said to render obvious all particular relative configurations.

Thus, for the reasons presented above, it is believed apparent that, with the amendments to claim 5, not only is the rejection based upon Oshima and Fujikawa now obviated, but claim 5 is also clearly patentable over any reasonable combination of Oshima, Fujikawa and/or Glinsner. Therefore, it is respectfully submitted that claim 5, as well as claims 7-13 which depend therefrom, are clearly allowable over the prior art of record.

The Examiner's attention is also directed to the new dependent claims 12 and 13 which further define the present invention over the cited prior art. In particular, claim 12 now specifies that the main shaft 109 has only the eccentric section 110, the piston 117, the connecting rod 118 and the balancing weight 108 eccentrically connected thereto, as shown, for example, in Figs. 1-3. Claim 13 specifies that eccentric rotary connection to the main shaft 109 is provided only at the eccentric section axis 110', also as shown in Figs. 1-3 and in particular, in Fig. 3. These additional features of the present invention as now set forth in claims 12 and 13 clearly further distinguish over the cited prior art and, in particular, over the Glinsner configuration wherein, in addition to the eccentric section, the piston, the connecting rod and the balancing weight being eccentrically connected to the main shaft, the counterweight 120 and counterweight connecting rod 130 are also connected thereto. Similarly, in addition to the eccentric rotary connection of the eccentric section axis 100 in the Glinsner configuration, there is also provided an eccentric rotary connection (at counterweight connecting rod axis 170) of the counterweight 120 and counterweight connecting rod 130 to the main shaft 20.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is earnestly solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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